

THE BIOLOGY OF THE TREE LUCERNE MOTH *URESIPHITA ORNITHOPTERALIS* (GUENÉE) (LEPIDOPTERA: PYRALIDAE) IN SOUTHERN TASMANIA

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Introduction

Uresiphita ornithopteralis (Guenée), commonly called the Tree Lucerne Moth (McCallan, 1973), is indigenous to Tasmania occurring on several food plants. Although of only minor pest status, the moth may cause severe damage by the defoliation of garden shrubs and plants. Species of *Cytisus*, particularly *C. proliferus* L. (Tree Lucerne), and the many varieties of *Genista* (Brooms) grown in gardens as ornamental shrubs, are subject to attack. *U. ornithopteralis* was first described by Guenée (1857) who placed it in the genus *Mecyna*.

Specimens of the adult moth have been lodged with the Australian National Insect Collection.

Occurrence

Guenée (1857) recorded the moth from Tasmania while Hampson (1899) regarded the species as the only member of the genus in Australia. Butler (1877)

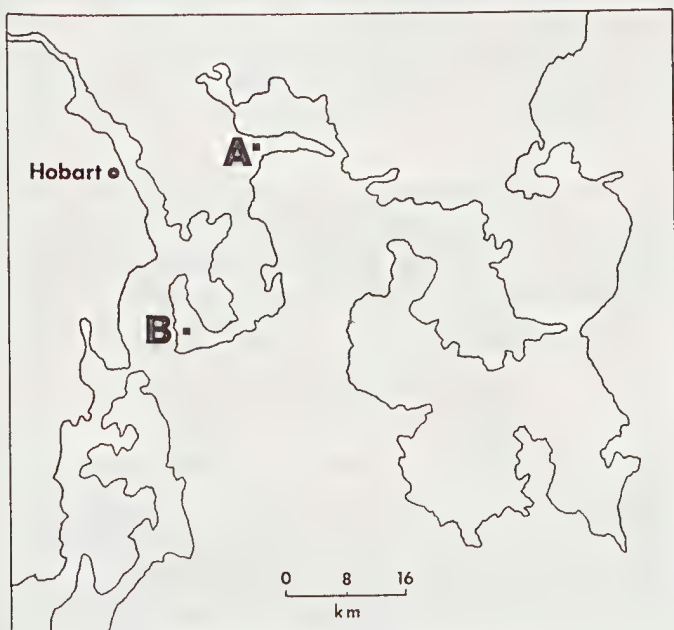


Fig. 1. Study areas in southern Tasmania.

noted the moth in a collection from New Zealand and Turner (1918) presents records from Lord Howe Island and Norfolk Island. Turner (1925) included *U. ornithopteralis* from Launceston and Hobart in a revision of Tasmanian Lepidoptera.

Specimens have been recorded from Blackmans Bay, Dodges Ferry, Lindisfarne, Mt Stuart, Tarooma and Verona Sands on *C. proliferus* and various garden shrubs, and from Sandy Bay on *Betula pendula* Roth. (Silver Birch) (Martyn *et al.* 1969, 1970, 1975, 1976). Other specimens have been collected from ornamental lupins at Lauderdale, and from *C. proliferus* at Sandy Bay (Bashford, unpublished).

Specimens in this study have been collected in southern Tasmania from two areas each with a different host plant (Fig. 1); from Llanherne (Area A), on *Genista monspessulana* (L.) Johnson (Canary Broom) and from South Arm (Area B) on *Genista maderensis* (Webb and Berth.) Lowe (Mediterranean Broom).

Culture methods

Observations on the larval and pupal stages were made from field collected eggs and larvae maintained in the laboratory. Egg batches on leaves placed on damp filter paper in glass petri plates hatched without mortality. The individual groups of larvae from each egg batch were placed in glass dishes, 15 x 15 x 3 cm, containing fresh *Genista* foliage, and held in a cage outdoors. Fresh food was supplied as required and the dishes were cleaned weekly to prevent fungal attack. Specimens required for head capsule measurements were removed from the cultures regularly, killed in 50% alcohol, then measured under x25 magnification using a graticula. All adults emerging from cultures or caught in light traps were sexed.

Description

Egg:— The flat oval egg is laid within a batch of 10-15 on the upper leaf surface. When first laid the egg is white in colour and turns pale yellow after 24 hours. The transparent irregularly shaped chorion is soft and flexible (Fig. 3).

TABLE 1. Egg measurements (mm). Means of 20 eggs.

	egg	chorion
Width	0.64	0.80
Length	1.12	1.44
Thickness	0.32	0.32

Larva:— First instar pale green with black markings, head capsule brown. Final instar (fourth) pale green with a few hairs and black lateral areas containing white spots around the spiracles of each segment. Head capsule brown after ecdysis, darkening to black late in each instar. Three thoracic segments each with a pair of segmented legs. Abdominal segments carry four pairs of prolegs, and prolegs on terminal segment (Fig. 4).

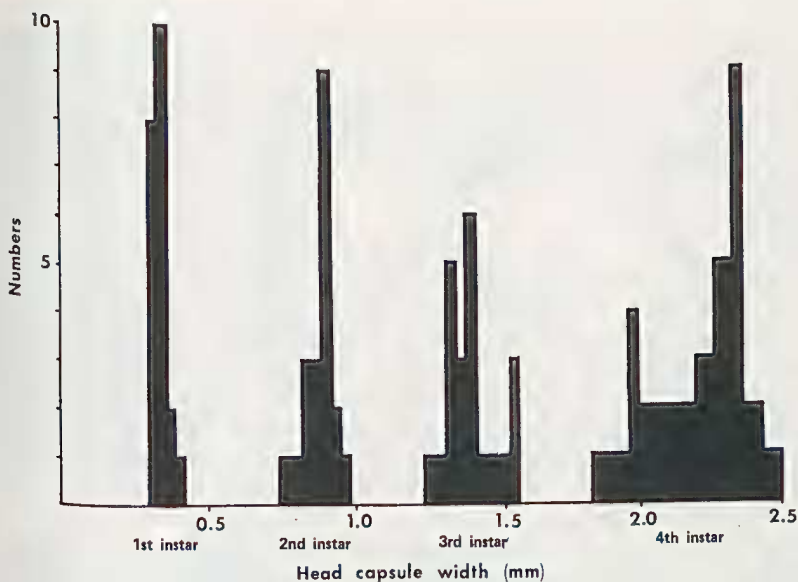


Fig. 2. Histogram of head capsule widths of *Uresiphita* larvae.

TABLE 2. Body length measurements (mm).

instar	mean	range	n
1	3.3	2.2 - 5.8	21
2	9.4	8.7 - 9.6	16
3	11.6	9.1 - 14.1	20
4	23.0	17.4 - 29.9	33

Pupa:— The pupa is slender, delicate, light brown in colour becoming very dark as the pharate adult darkens a few days before emerging (Fig. 5).

TABLE 3. Pupal measurements (means of 10 pupae).

Length	13.8 - 15.8 mm
Width	3.7 - 4.0 mm
Weight	0.06 - 0.12 g
Mean weight of males	0.11 g
Mean weight of females	0.09 g

Adult:— The moth conforms to the generic description of *Uresiphita* (*Mecyna*) by Hampson (1899).

Sexes are similar in both coloration and wing pattern. Forewing dark brown to black with broad patterned grey transverse band from costa to tornus. Hind wing orange with margins brown to black, dorsum fringe orange. Dorsal region of head black, ventral region white. Labial palps beak-like, black. Thorax black dorsally and white underneath. Abdomen dark yellow with black dorsal stripe and white ventral surface (Figs 6, 7).

Adult wing venation and structure of frenulum are as illustrated by Common (1970).

Sexual differences: — (1) Frenulum: male with a single robust bristle; female with two bristles, one stout, one slender. (2) Scales on anal segment: male long and tufted; female short, fringing the external genitalia. (3) Males often lighter in colour with slightly smaller wing span.

Biology

Eggs are laid in groups overlapping in a regular 'tile' formation as the female moves down the midrib of the leaf. Eggs are first laid near the tip of the leaf, the female moving towards the central axis of the shoot. Most egg batches are laid on the upper leaf surface. Hatching occurs after 10-14 days and the gregarious first instar larvae feed on the leaf surface at the egg site, creating characteristic patches. The second instar larvae individually migrate. They move to the tips of leaflets where they spin a fine protective web around the shoot on which they are feeding. Growth and development through four instars takes 27-56 days (Fig. 2).

If the larval density is high (3-5 larvae per shoot) severe defoliation will occur, frequently killing some branches (Fig. 8). The final instar larvae migrate after a period of feeding and pupate within a fine white silk web spun in loose litter or in sheltered positions. Migrations of up to 30 metres by final instar larvae seeking pupation sites have been observed.

TABLE 4. Duration of larval instars.

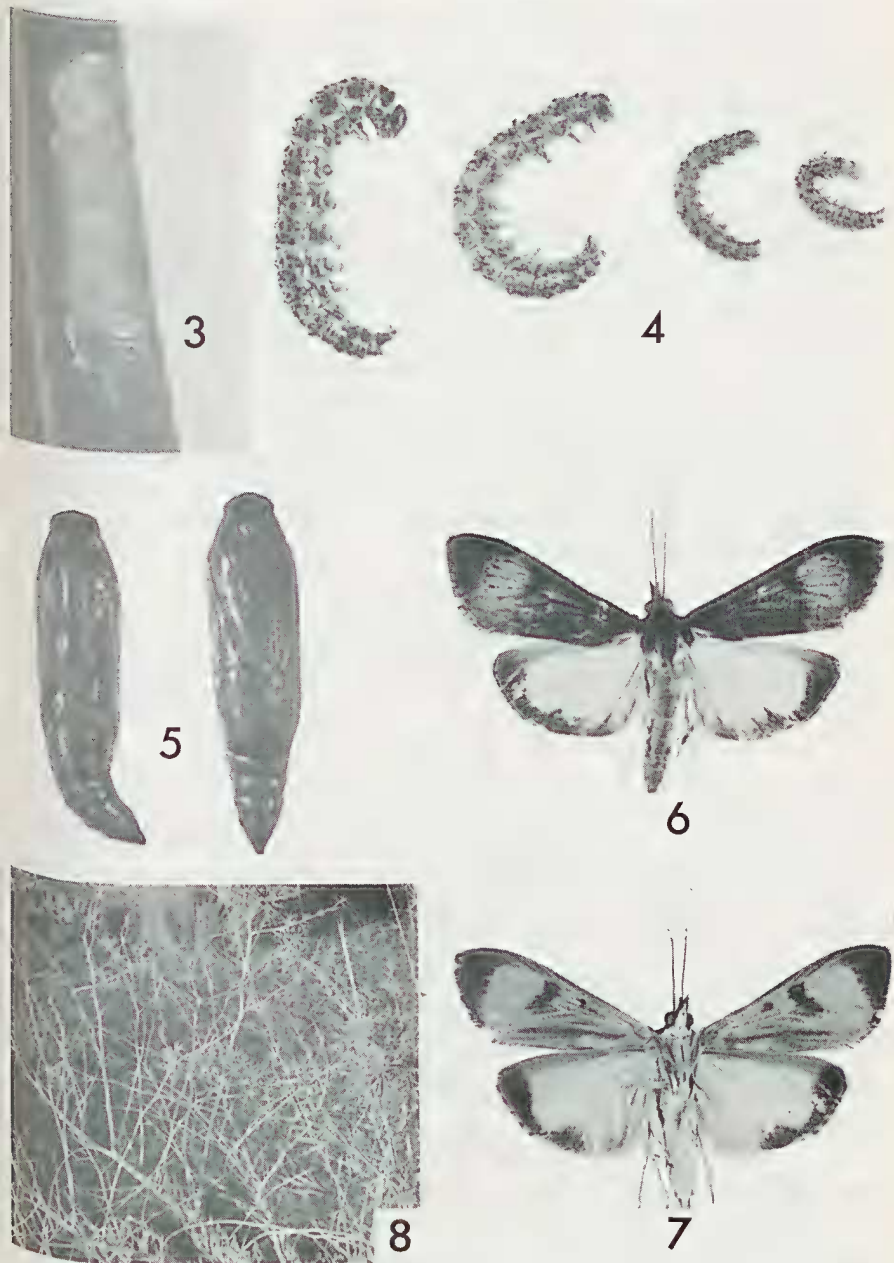
instar	days
1	4 - 10
2	10 - 12
3	7 - 9
4	6 - 25

The pupal duration varies with each generation.

TABLE 5. Duration of pupal period (days).

emergence	range	mean	
January	9 - 12	11	n = 5
April	21 - 41	35	n = 9
July	84 - 114	100	n = 4

Moths have been taken in UV light traps at the study sites each year since February 1972. These collections demonstrate clearly three distinct flight periods each year. The two major emergence periods are (a) mid-March to mid-April, and (b) mid-June to late July. The third emergence period, resulting from a small over-wintering larval population, occurs from early November to early February, the peak being mid-January. The life span of adult moths held in outdoor cages ranged from 4 - 9 days. The sex ratio of males to females was 4:1 in the cultures and 0.9:1 in the light trap collections.



Figs 3-8. *Uresiphita ornithopteralis*: (3) egg batch on leaf; (4) larval instars 1-4; (5) pupae; (6) dorsal and (7) ventral markings of male adult; (8) severe defoliation of *G. monspessulana*.

Despite field collections of several hundred larvae from different sites and over several seasons no parasitism has been recorded. The larvae react violently when touched or disturbed by curling and twisting the body and by regurgitating gut contents. The fine network of silk around the shoots affords a degree of protection while the larvae are feeding.

Discussion

U. ornithopteralis completes three generations each year in southern Tasmania, and appears to be free from parasitism. No bird predation has been observed but numbers of Blue Wrens (*Malarus cyaneus*) are frequently active at study sites in *Genista* bushes. Due to the clearing of land at the study sites, the area occupied by the host plants has been greatly increased. The moth population has increased particularly at Llanherne where the majority of new *Genista* plants carry several larvae per twig at different stages of development virtually throughout the year. The ability of the plant to re-leaf eaten shoots in a short period enables three generations a year to be completed. Damage to *Genista* can be significant and prized garden shrubs may be severely defoliated. Hand removal of the larvae as they appear will enable the gardener to prevent noticeable damage.

Acknowledgements

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